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FORM PTO-1390 (REV. 9-2001) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY 'S DOCKET NUMBER 2406400-2
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		U.S. APPLICATION NO. (If known, see 37 CFR 1.5 10/070528
INTERNATIONAL APPLICATION NO. PCT/EP00/08704	INTERNATIONAL FILING DATE 06 September 2000 (06/09/00)	PRIORITY DATE CLAIMED 06 September 1999 (06/09/99)

TITLE OF INVENTION
METHOD AND DEVICE FOR MONITORING AND CONTROLLING THE OPERATIONAL PERFORMANCE

APPLICANT(S) FOR DO/EO/US
PLANKI, Peter et al.

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☐ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. ☒ is attached hereto (required only if not communicated by the International Bureau).
   b. ☐ has been communicated by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
   a. ☐ is attached hereto.
   b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☐ Amendments to the claims of the International Aplication under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. ☐ are attached hereto (required only if not communicated by the International Bureau).
   b. ☐ have been communicated by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ An English lanugage translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 20 below concern document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☐ A FIRST preliminary amendment.
14. ☐ A SECOND or SUBSEQUENT preliminary amendment.
15. ☐ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☒ Other items or information:

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EV 000 475 766 US

INTERNATIONAL SEARCH REPORT (ENGLISH AND GERMAN VERSIONS)

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U.S. APPLICATION NO. (if known, see 37 CFR 1.5) 10/070528	INTERNATIONAL APPLICATION NO. PCT/EP00/08704	ATTORNEY'S DOCKET NUMBER 2406400-2

21. [x] The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):

	CALCULATIONS	PTO USE ONLY
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO **$1040.00**		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO **$890.00**		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO **$740.00**		
International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) **$710.00**		
International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) **$100.00**		
ENTER APPROPRIATE BASIC FEE AMOUNT =	$ $890.00	
Surcharge of **$130.00** for furnishing the oath or declaration later than [ ] 20 [ ] 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	$	
Total claims	8 - 20 =	0	x **$18.00**	$	
Independent claims	2 - 3 =		x **$84.00**	$	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ **$280.00**	$ $280.00	
TOTAL OF ABOVE CALCULATIONS =				$ $1,170.00	

[x] Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2. +	$	
SUBTOTAL =	$ $585.00	
Processing fee of **$130.00** for furnishing the English translation later than [ ] 20 [ ] 30 months from the earliest claimed priority date (37 CFR 1.492(f)).	$	
TOTAL NATIONAL FEE =	$	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property +	$	
TOTAL FEES ENCLOSED =	$ $585.00	
	Amount to be refunded:	$
	charged:	$

a. [x] A check in the amount of $ $585.00 to cover the above fees is enclosed.

b. [ ] Please charge my Deposit Account No. 500-354 in the amount of $ ______ to cover the above fees. A duplicate copy of this sheet is enclosed.

c. [x] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 500-354. A duplicate copy of this sheet is enclosed.

d. [ ] Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

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10/070582

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METHOD AND DEVICE FOR MONITORING AND CONTROLLING THE OPERATIONAL PERFORMANCE OF A COMPUTER OR PROCESSOR SYSTEM

The present invention relates to a method and device for monitoring and controlling the operational performance of a computer or processor system and a device for accomplishing this method.

Serviceability and operational reliability of components, assembly groups, devices and hence a computer or processor system as a whole is only protected within certain tolerance zones of physical values in their environment. These physical values are particularly temperature, but also air humidity, air flow, freedom of dust and percussions. Depending upon the field of application of the system to be monitored, brightness oscillations, chemical pollutions or other variables may also be of importance. If one or more of these values lie beyond the predetermined tolerance zones, this may lead to interferences of the performance of the respective component, but also to a complete failure thereof. At worst, the failure of one individual component may lead to a collapse of the complete system.

Particularly in case of larger computer or processor systems , as for example mainframe computers or multiprocessor systems a continuous and faultless operation is of great importance and in particular as calculations on these devices often run over a very long period of time so that a failure of the system at a certain time probably ruins the work of several days. For this reason, temperature monitoring systems are known measuring the temperature at individual components of the system and when detecting an inadmissibly increased temperature switch off the respective component, for example, or – in case of a processor – effect a decrease of performance by mans of reducing the clock frequency. In particularly critical cases a controlled shutdown of the complete system is effected.

It is the main object of the hitherto known monitoring systems to avoid a sudden collapse of the complete system due to a previous shutdown of individual components or the controlled shutdown of the system. This may avoid the loss of data, but often leads to

a drastic reduction of the performance of the complete system, which often would not be necessary to this extent.

Hence it is the object of the present invention to provide a possibility of monitoring and controlling the operational performance of a computer or processor system, wherein the influence of a fault on the serviceability of the monitored system is reduced and the serviceability thereof is maintained or prolonged in case of controllable incidents. Active calculation processes as well as their data bases and results are to be protected to the greatest possible extent.

This object is solved by the method of claim 1 and the device of claim 4. According to the inventive method the operational parameters of individual components of the computer or processor system to be monitored as well as environmental parameters thereof are detected in a first step. In a second step the detected parameters and environmental parameters are compared with predetermined limit values. Thereby it is detected, if one or several of said detected operational parameters and environmental parameters have exceeded or fallen below of said predetermined limit values. Based upon these limit values that have been exceeded or fallen below of, a so-called operational event is determined in a next step, informing how and to which extent the system is affected by these faults. Then a reaction corresponding to the afore determined operational event is selected from a number of predetermined reaction patters and finally a control command for altering the operational performance corresponding to said reaction is transmitted to the computer or processor system to be monitored.

Hence, according to the invention a reaction is initiated in dependence upon the kind and intensity of a fault occurring in the system to be monitored , said reaction avoiding damages of components, assembly groups, devices and consequently of the computer or processor system as a whole, which would have occurred in cased of an unrestricted continuation of the operation. If the parameters lie beyond tolerable limit values a controlled shutdown of the complete system may be initiated. Moreover, there is the possibility of re-activating or running up individual components or even the complete system, if the fault has been removed or at least reduced.

Contrary to the hitherto known solutions for monitoring computer or processor systems the inventive method guarantees the continuation of the serviceability of the system with highest possible efficiency and simultaneous protection of the active computing processes. This is due to the fact that the individual components are monitored independently of each other by measuring sensors and that when predetermined limit values are reached a complete shutdown of the complete system and hence an interruption of the running programs does not have to be effected necessarily. Quite to the contrary, if justifiable, the individual components, assembly groups or devices are switched off individually or reduced in their performance, whereby the system as a whole, however, remains operable. Thereby, the predetermined reaction patters allow a fault-adequate reaction as well as specific monitoring and selecting of the individual components.

It is also an advantage of the present invention that in contrast t the hitherto known monitoring systems this system enables a complete monitoring of potential interferences within and outside the computer or processor system and not only a monitoring of the temperature. Thus, the interferences of too high air humidity, too low air flow, of dust or percussions may also be detected and taken into account. Further, the inventive method may be applied independent of buses and hence of producers in all kinds of systems, guaranteeing the highest possible amount of flexibility. This refers to already existing systems or computer or processor systems to be still produced.

According to an embodiment of the present invention the detected operational parameters or environmental parameters are not absolutely measured values but also temporal changes of these measured values. This offers the possibility to meet appropriate countermeasures. Thus, a very rapid temperature rise of a monitored component leads to another reaction than a merely moderate rise. It may furthermore be provided that besides the transmission of the control command corresponding to a selected reaction also a corresponding information signal is to be issued in an optical or acoustic form, in order to inform a service staff as soon as possible of place and reason of the fault. This information signal may also be the transmission of a SMS-message.

The device according to the invention for monitoring and controlling the operational performance on the one hand comprises first sensors for detecting operational parameters and on the other hand second sensors for detecting environmental parameters of the system. A monitoring unit for comparing the detected operational and environmental parameters with limit values stored in a first storage as well as for detecting if one or several of the limit values have been exceeded or fallen below of, is further provided. Due to appropriate means an operational event message is generated on basis of the exceeding or falling below of said limit values and are transmitted to a control unit, selecting from another storage containing a number of predetermined reaction patters a control command corresponding to said operational event message and transmitting same to said computer or processor system.

In a further embodiment the inventive device may comprise an acoustic or optical output means for outputting a message corresponding to the operational event message and/or the transmitted control command. Further, a transmitting device for communicating this message, for example in form of a SMS-message, may be provided. The independent control of the system is guaranteed in that the monitoring device is part of a computer which is separate from the system to be monitored.

In the following the invention is explained in greater detail in the drawings:

Fig. 1 shows an inventive device for monitoring a computer system in a schematic view; and

Figs. 2 to 4 show different examples for explaining the reaction to the temperature rise of a component to be monitored.

Fig. 1 shows the monitoring of a mainframe computer 1 by an inventive monitoring device 2. Thereby, several first sensors 3 are arranged in said mainframe computer 1, detecting operational parameters of individual components or assembly groups of said mainframe computer and transmitting said data via respective lines 4 to said monitoring device 2. Said first sensors 3 are for example temperature sensors, but also sensors for detecting voltage fluctuations, percussions or other values which are relevant for the

operation. Besides said first sensors second sensors are provided for detecting parameters in the environment of said mainframe computer 1, as for example sensors for detecting chemical pollutions of the air, dust or smoke, air humidity or in certain cases also of ionising radiation. These sensors may particularly be temperature sensors. The measured values detected by said second sensors are also transmitted via respective lines 6 to said monitoring device 2.

The operational and environmental parameters detected by said first and second sensors 3 and 5 first of all are being processed in a monitoring unit 7 of said monitoring device 2, whereby the detected values are compared to limit values, which are listed in a first memory 8. Thereby, it is not necessary to provide only one single limit value for each monitored value. Moreover, preferably several limit values, a lower, a mean as well as an upper limit value are provided so that it is possible to react specifically to the occurrence of a fault. When exceeding the lower limit value, for example, only a slight change of the operational performance of the computer system is necessary, whereas when the upper limit value is exceeded, this leads to a shutdown of the respective component or possibly even of the complete system.

If one or more of the limit values stored in said first memory 8 are exceeded or fallen below of, this is detected by said monitoring unit 7 and a corresponding operational event message is generated on basis of exceeding or falling below of the limit values , which then is communicated to said control unit 9. This operational event message informs about kind and extent of the fault. In the following the control unit 9 selects one control command corresponding to the operational event message from a number of predetermined reaction patterns contained in a second memory 10, and transmits said control command to the mainframe computer 1. This control command contains instructions for altering the operational performance and for example may be the instruction to shut down individual components or put them into a sleep modus or to reduce the capacity of the system. Furthermore, also the command to shut down the complete system may be transmitted. Thereby, the reaction patterns are chosen such that the mainframe computer 1 and the programs running thereon may still continue under the new operational conditions predetermined by said reaction patterns, if this is justifiable.

Once the influence of the fault has been successfully removed or at least reduced, a control command transferred from said monitoring device 2 to said mainframe computer 11 may contain, however, to run up the system again and to re-activate components which have been shut down before. If the monitoring unit has generated an operational event message or the control unit has transmitted a control command, simultaneously a respective information signal may be transmitted to a transmission device 15 via a second output line 14. Then, for example, respective SMS-messages may be transmitted to the service staff by means of said transmission device 15. As an alternative there is also the possibility of applying an optical or acoustic output means instead of a transmission device.

Preferably, the complete monitoring device 2 is part of a computer which is separate from the monitored mainframe computer 1. The flexibility of the inventive device is guaranteed in that new limit values and new reaction patters may be inscribed into the two memories 8 and 10 via input lines 12 and 13. <this provides the possibility of a reaction to changes in the configuration of the system to be monitored at any time. This further provides the possibility of an isolated view not only of the performance of individual operational or environmental parameters, but to evaluate them in combination and to react accordingly. A slight temperature increase of a monitored component, for example, does not necessarily have to lead to a shutdown of this component, if an adjacent component shows a clearly increased temperature, as the reason for the temperature increase of said first component very likely is to be found in the severe overheating of the adjacent component. In such a case, it is first sufficient to only shut down the severely overheated component.

Based on the example of the monitoring of the temperature the functioning of the inventive method is to be described in an exemplary manner in the following. Particularly the temperature monitoring of the individual components is of increasing importance as due to the increase of performance and increase of packing density of the components, demanded by the market and related to the general development, lead to problems in controlling the temperature. Figures 2 to 4 show the temperature course of a component be monitored, for example a processor. In the present example three different limit values, a lower, a mean and an upper limit value are defined, causing different reactions when

being exceeded or fallen below of. Furthermore, the example shown in Figures 2 to 4 not only refers to the absolute temperature value but also to the course of time.

In Fig. 2, for example, a moderate temperature increase is detected for the monitored time, during the course of which merely the lower limit value is exceeded. Thus, if the lower limit is exceeded, first only the performance of the monitored processor is reduced, for example by reducing the clock frequency. As an alternative, however, also the performance of a respective refrigerating set may be increased. If these measures are successful, the system may be continued to be operated in this mode until the service staff arrives, who has been informed by a message transmitted simultaneously by means of the respective control command. A shutdown of the component or of the complete system is not necessary in this case.

In case of a faster temperature rise, as for example shown in Fig. 3, the afore described measures do not lead to success and in the course of time also the other two limit values are exceeded. When the upper limit value is exceeded, at the latest a shutdown of the monitored processor has become necessary. If, due thereto, the temperature falls below the predetermined limit values again, the complete system may be continued to be operated with shutdown processor until the arrival of the service staff. If, however, the shutdown of the processor does not lead to a temperature decrease either – for example within a predetermined time limit – it is safer to run down the complete system by means of the shutdown procedure, in order to store the already existing data.

An abrupt temperature rise, as shown in Fig. 4, however, is indicative of an extraordinary fault demanding the immediate shutdown of the complete system in any case. Due to the severe temperature rise the exceeding of further limit values it is not to be waited for , but the shutdown is to be initiated immediately.

The consideration of a time variations of a monitored parameter may, for example, also be effected by a separate sensor, exclusively detecting the variations of the monitored values. There is another possibility in detecting the time points at which certain limit values are exceeded or fallen below of and , on basis thereof, drawing a conclusion concerning the time behaviour.

According to the invention also a number of other values of measurement besides the temperature may be monitored. Thereby the respective reaction pattern not only depends upon the measured value itself, but also on the respective place of measurement. A number of possible reaction patterns is enlisted in the following table. Therein GW describes a parameter to be monitored, the exceeding of which leads to a shutdown of the respective component or that it is put into a sleep modus. The definition of one single limit value is sensible in cases where the respective component either should be fully operating or not operating a all. In other cases preferably several limit values are defined, i.e. a lower, a mean and an upper limit value, in order to be able to react in a graded manner.

TABLE: REACTION PATTERNS

Measured values	Place of measurement	Reaction pattern (exemplary)
1. temperature	a) at the individual component or at a device b) at the air inlet c) outside computer housing in the room d) external, e.g. adjacent rooms fire-alarm etc.	e) GW: shutdown of the individual component, the device (sleepmodus) f) lGW: reduce system performance mGW: switch off ventilator uGW: controlled system shutdown g) same as b) h) fixed to local facts
2. air humidity	a) at the individual component or at a device b) at the air inlet c) outside computer housing in the room	d) GW: shutdown of the individual component, the device (sleepmodus) e) lGW: reduce system performance mGW: switch off ventilator uGW: controlled system shutdown f) same as b)
3. percussion (acceleration of frequency)	a) at the individual component or at a device b) at the computer housing	c) GW: shutdown of the individual component, the device (sleepmodus) d) lGW: rotating devices (e.g. hard disks) shutdown uGW: controlled system shutdown
4. air flow	a) at the individual component or at a device b) at the air outlet	c) GW: shutdown of the individual component, the device (sleepmodus) d) lGW: reduce system performance uGW: controlled system shutdown
5. dust, smoke, aerosol (e.g. optoelectronical measurement)	a) at the air inlet b) outside computer housing in the room	c) lGW: reduce system performance mGW: switch off ventilator uGW: controlled system shutdown d) same as a)
6. chemical pollution of the air (e.g. electrical conductibility of the air, ph-value)	a) at the individual component or at a device b) at the air inlet c) outside computer housing in the room	d) GW: shutdown of the individual component, the device e) lGW: reduce system performance mGW: switch off ventilator f) uGW: controlled system shutdown g) same as b)

7. electro-magnetic-field	a) at the individual component or at a device b) outside computer housing in the room	c) GW: shutdown of the individual component, the device d) IGW: reduce system performance uGW: controlled system shutdown
8. voltage oscillation	a) at the individual component or at a device b) main voltage	c) GW: shutdown of the individual component, the device d) (in case of no UPS:) IGW: reduce system performance uGW: controlled system shutdown
9. brightness oscillation (optoelectronic)	a) at the individual component or at a device	b) (relevant for optoelectronic components GW: shutdown of the individual component, the device
10. ionised radiation (X-ray radiation, radio-active radiation)	a) at the individual component or at a device b) outside computer housing in the room	c) GW: shutdown of the individual component, the device d) IGW: reduce system performance uGW: controlled system shutdown
11. further measurements to be defined	./.	./:

GW=limit value IGW = lower limit value mGW=mean limit value uGW=upper limit value

Thereby, the monitoring of temperature is not only possible at the individual components but for example also at an air intake channel of the system, outside the system, in a room and in adjacent rooms. A change of temperature at the air intake channel may, for example, result in a change of the behaviour of the ventilator, as may be seen from the table.

Another parameter which is essential for the operational behaviour is the air humidity, which again may be detected at the element itself but also at the air intake channel or outside in the room. Here, an increased air humidity at the air intake channel may lead to the fact that first the system performance is reduced or the ventilator is switched off. Only as the upper limit value is exceeded, the system has to be shut down in a controlled manner for safety reasons.

Percussions occurring inside or outside the system may also be monitored and therefore rotating elements like disk drives could be shut down, if justifiable.

If, however, the percussions become too severe, a controlled shutdown of the system is necessary. Further parameters to be monitored may be the air flow the contents of dust, smoke or aerosols as well as chemical pollutions of the air. Again, a simple measure may be to initially shut down the ventilator. If this does not lead to a success and if an upper limit value is exceeded, the consequence is a system shutdown.

Furthermore, the electromagnetic field intensity or voltage oscillations may be monitored. If optoelectronic components are used, brightness oscillations may further be taken into account. Finally, if necessary, the influence of ionising radiation may be taken into account in order to avoid any incidents.

It is the object of the inventive method to offer a maximum amount of flexibility and at the same time to enable an appropriate reaction to incidents of any kind. This offers the possibility to keep the system to be monitored operating while maintaining the largest possible performance.

Claims

1. Method for monitoring and controlling the operational performance of a a computer or processor system (1) comprising the following steps:

(a) detecting operational parameters of individual components as well as of environmental components of the computer or processor system (1);

(b) comparing the detected operational parameters and environmental parameters with predetermined limit values;

(c) determining, if predetermined limit values are exceeded or fallen below of by one or several of said detected operational parameters and environmental parameters;

(d) determining an operational event on basis of said limit values that have been exceeded or fallen below of;

(e) selecting s reaction corresponding to said determined operational event from a number of predetermined reaction patterns; and

(f) transmitting a control command to alter the operational performance corresponding to said selected reaction to said computer or processor system (1).

2. Method of claim 1,

characterized in

that the detected operational parameters or environmental parameters are absolute measured values as well as the temporal change of said measured value.

3. Method of one of the preceding claims,

characterized in

that besides the transmission of the control command corresponding to the selected reaction also a corresponding information signal is transmitted.

4. A device for monitoring and controlling the operational performance of a computer or processor system (1), comprising:

first sensors (3) for detecting operational parameters of individual components of said computer or processor system (1),

second sensors (5) for detecting environmental parameters of said computer or processor system (1),

a monitoring unit (7) for comparing said detected operational and environmental parameters with limit values stored in a first storage (8) as well as for detecting, if one or several limit values are being exceeded or fallen below of,

means for generating a determined operational event message on basis of said limit values that have been exceeded or fallen below of, and

a control unit (9) for receiving said operational event message as well as for selecting and transmitting a control command corresponding to said operational event message to said computer and processor system (1) from a storage (10) containing a number of predetermined reaction patterns.

5. Device of claim 4,
characterized in
that said detected operational parameters or environmental parameters are absolute measured values as well as the temporal changes of said measured value.

6. Device of claim 4 or 5,
characterized in
that said device further comprises an optical or acoustic output means for outputting a message corresponding to said operational event message and/or said transmitted control command.

7. Device of one of claims 4 to 6,
characterized in

that said device comprises a transmission means (15) for transmitting a message corresponding to said operational event message and/or to said transmitted control command.

8. Device of one of claims 4 to 7,

characterized in

that said device is part of a computer which is separate from the computer or processor system (1) to be monitored.

Summary

In order to monitor and control the operational performance of a computer system or processor system (1), operational parameters of individual components as well as environmental parameters of the computer system or processor system (1) are detected. Said parameters are compared with predetermined limit values. If it is determined that one or more of the detected operational parameters and environmental parameters have exceeded or fallen below of the predetermined limit values, an operational event is determined based on the limit values that have been exceeded or fallen bellow of. A reaction is selected from a number of predetermined reaction patterns according to the determined operational event, and a control command which corresponds to this reaction and which is provided for altering the operational performance is transmitted to the computer to be monitored. This enables an early detection of the occurrence of faults as well as the initiation of an appropriate measure.

(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

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(81) Bestimmungsstaaten (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

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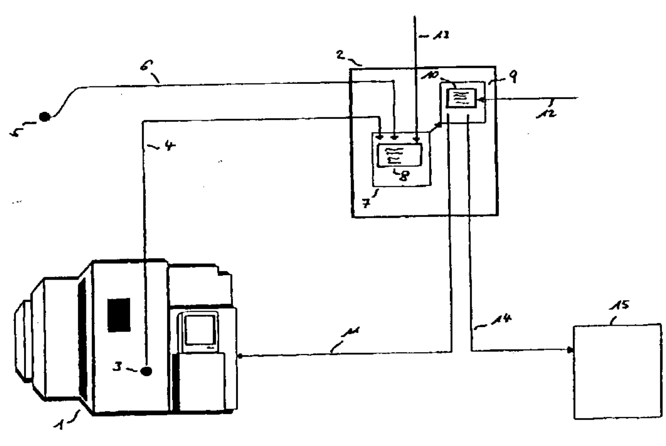
[Fortsetzung auf der nächsten Seite]

(54) **Title:** METHOD AND DEVICE FOR MONITORING AND CONTROLLING THE OPERATIONAL PERFORMANCE OF A COMPUTER SYSTEM OR PROCESSOR SYSTEM

(54) **Bezeichnung:** VERFAHREN BZW. VORRICHTUNG ZUR ÜBERWACHUNG UND STEUERUNG DES BETRIEBSVERHALTENS EINES COMPUTER- ODER PROZESSORSYSTEMS

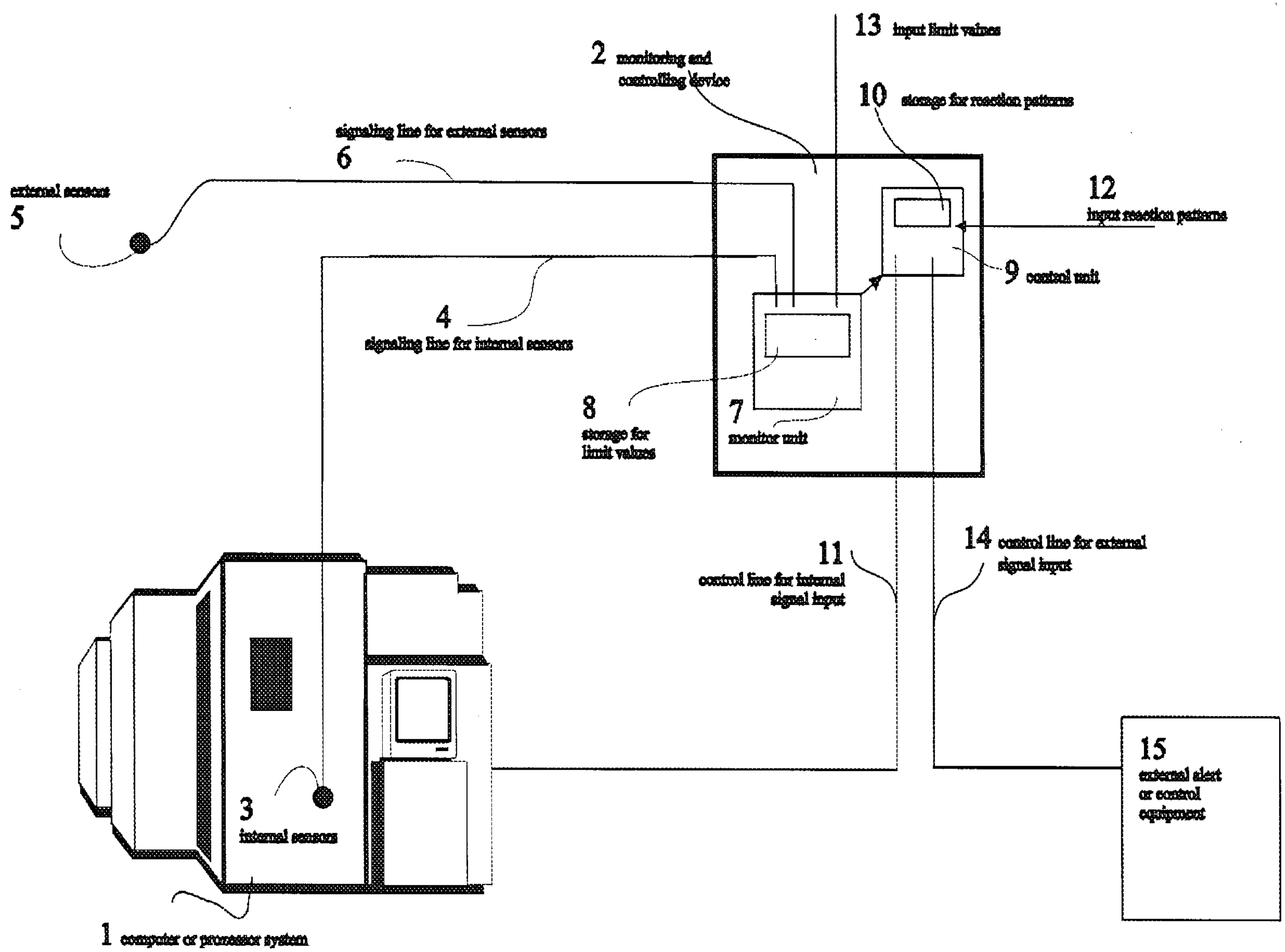


(57) **Abstract:** In order to monitor and control the operational performance of a computer system or processor system (1), operational parameters of individual components as well as environmental parameters of the computer system or processor system (1) are detected. Said parameters are compared with predetermined limit values. If it is determined that one or more of the detected operational parameters and environmental parameters have exceeded or fallen below of the predetermined limit values, an operational event is determined based on the limit values that have been exceeded or fallen below of. A reaction is selected from a number of predetermined reaction patterns according to the determined operational event, and a control command which corresponds to this reaction and which is provided for altering the operational performance is transmitted to the computer to be monitored. This enables an early detection of the occurrence of faults as wells as the initiation of an appropriate measure.

[Fortsetzung auf der nächsten Seite]

WO 01/18632 A2

Fig. 1



13 input limit values
2 monitoring and controlling device
10 storage for reaction patterns
signaling line for external sensors
6
external sensors
5
12
input reaction patterns
9 control unit
4
signaling line for internal sensors
8
storage for limit values
7
monitor unit
11
control line for internal signal input
14 control line for external signal input
3
internal sensors
15
external alert or control equipment
1 computer or processor system

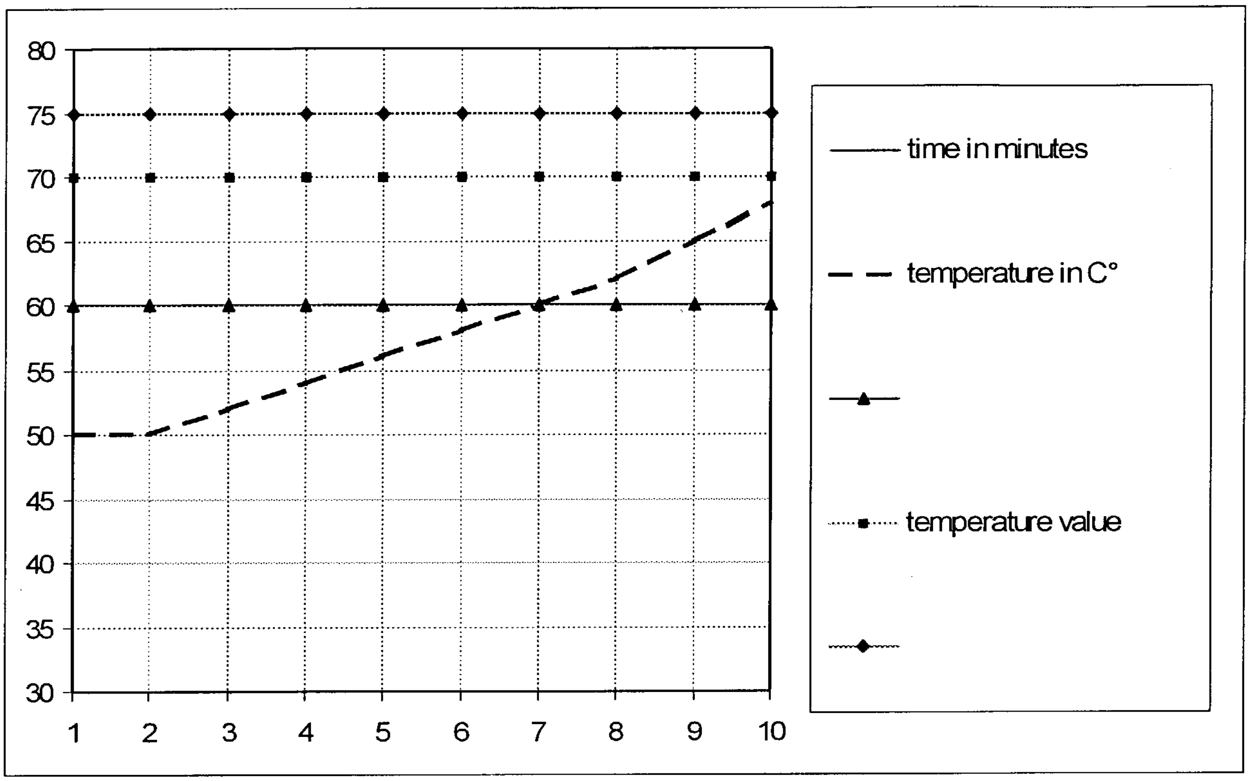

80
75
70
65
60
55
50
45
40
35
30
1
2
3
4
5
6
7
8
9
10
time in minutes
temperature in C°
temperature value

Fig. 2

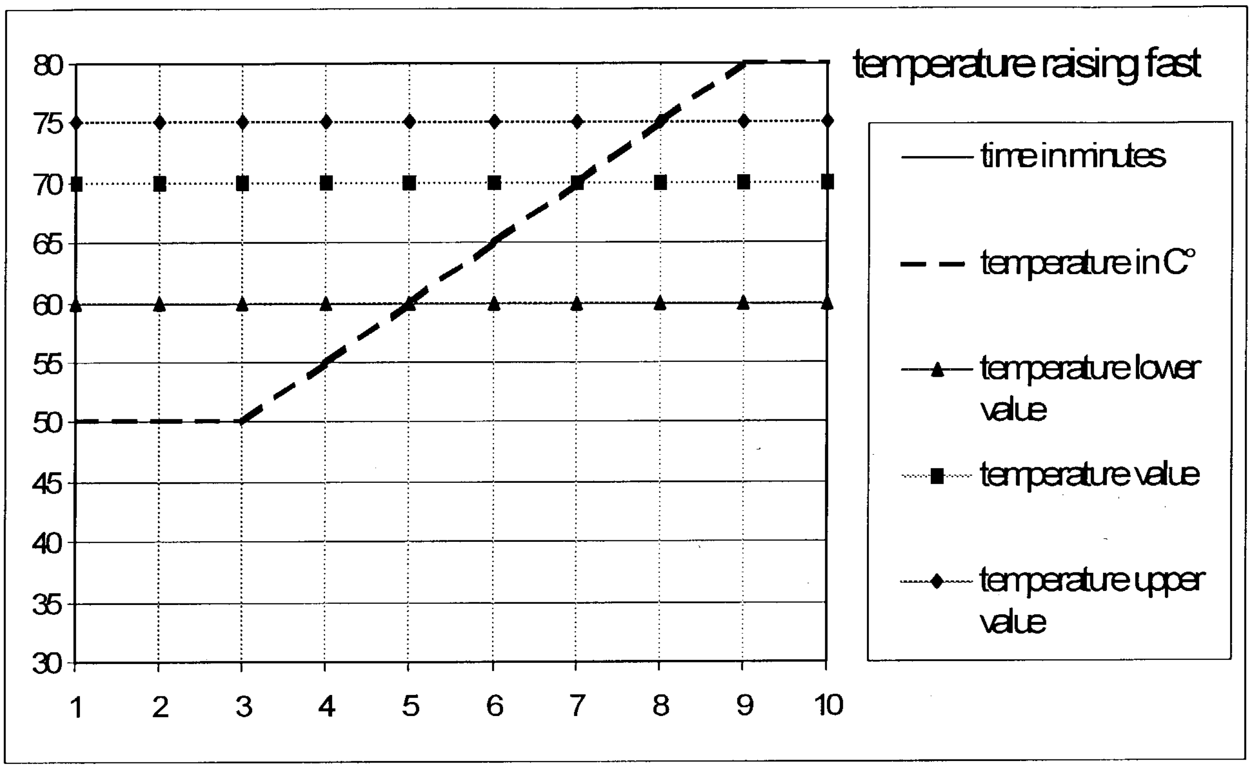

temperature raising fast
80
75
70
65
60
55
50
45
40
35
30
1
2
3
4
5
6
7
8
9
10
time in minutes
temperature in C°
temperature lower value
temperature value
temperature upper value

Fig. 3

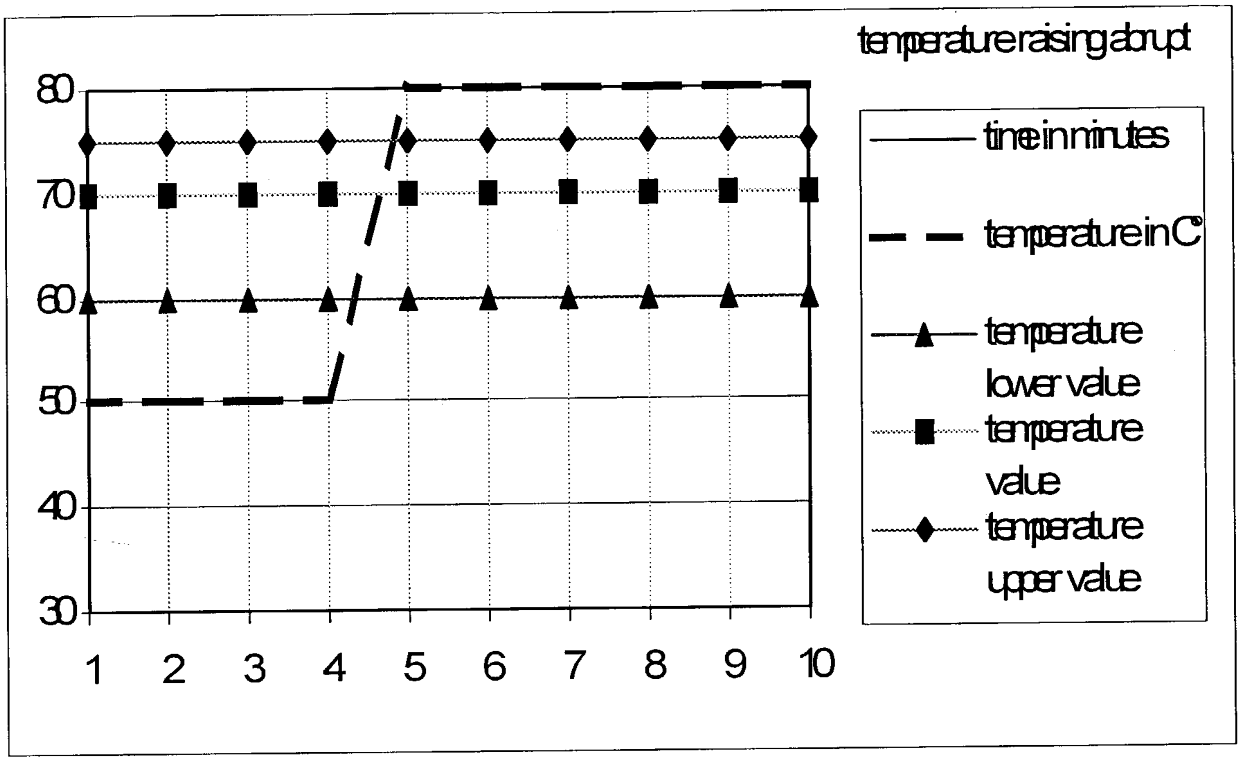

temperature raising abrupt
80
70
60
50
40
30
1
2
3
4
5
6
7
8
9
10
time in minutes
temperature in C
temperature lower value
temperature value
temperature upper value

Fig. 4

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DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

☐ Declaration Submitted with Initial Filing OR ☒ Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)

Attorney Docket Number	5007546-1
First Named Inventor	PLANKI, Peter
COMPLETE IF KNOWN	
Application Number	10/070,528
Filing Date	03/06/2002
Art Unit	
Examiner Name	

As the below named inventor, I hereby declare that:

My residence, mailing address, and citizenship are as stated below next to my name.

I believe I am the original and first inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Method and Device for Monitoring and Controlling the Optional Performance

the specification of which

☐ is attached hereto

OR

☒ was filed on (MM/DD/YYYY) **03/06/2002** as United States Application Number or PCT International

Application Number **10/070,528** and was amended on (MM/DD/YYYY) ______ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? YES	NO
PCT/EP00P08704	EPO	06/09/2000	☐	☐	☐
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto:

If this Declaration becomes separated from its file please contact the Spencer Fane IP Group at 816-292-8100

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DECLARATION — Utility or Design Patent Application

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Address			
City	State	ZIP	
Country	Telephone	Fax	

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

NAME OF SOLE OR FIRST INVENTOR : [ ] A petition has been filed for this unsigned inventor

Given Name (first and middle [if any]): Peter		Family Name or Surname: Plankl	
Inventor's Signature: Peter Plankl			Date
Residence: City: Munich	State	Country: Germany DEX	Citizenship: German
Mailing Address: *Herzog-Heinrich-Strasse 25*			
City: Munich	State	ZIP: 80336	Country: Germany

NAME OF SECOND INVENTOR: [ ] A petition has been filed for this unsigned inventor

Given Name (first and middle [if any]): Karl-Heinz		Family Name or Surname: Lettmair	
Inventor's Signature: Karl-Heinz			Date
Residence: City	State	Country: Germany DEX	Citizenship: German
Mailing Address: Sportplatzstr. 26			
City: Stoffen	State	ZIP: 86932	Country: Germany

[ ] Additional inventors are being named on the _____ supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.

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POWER OF ATTORNEY OR AUTHORIZATION OF AGENT

Application Number	10/070,528
Filing Date	03/06/2002
First Named Inventor	PLANKI, Peter
Title	Method and Device for Monitoring
Group Art Unit	
Examiner Name	
Attorney Docket Number	5007546-1

I hereby appoint:

[X] Practitioners at Customer Number **21129** → *Place Customer Number Bar Code Label here*

OR

[ ] Practitioner(s) named below:

Name	Registration Number

as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith.

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Address					
Address					
City		State		Zip	
Country					
Telephone		Fax			

I am the:

[ ] Applicant/Inventor.

[ ] Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

SIGNATURE of Applicant or Assignee of Record	
Name	Peter Planki
Signature	
Date	

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

[ ] *Total of ________ forms are submitted.

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Kansas City, MO 64106
1-816-474-8100

POWER OF ATTORNEY OR AUTHORIZATION OF AGENT

Application Number	10/070,528
Filing Date	03/06/2002
First Named Inventor	PLANKl, Peter
Title	Method and Device for Monitoring
Group Art Unit	
Examiner Name	
Attorney Docket Number	5007546-1

I hereby appoint:

[X] Practitioners at Customer Number 21129 → Place Customer Number Bar Code Label here

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Name	Registration Number

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Address					
Address					
City		State		Zip	
Country					
Telephone		Fax			

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[ ] Applicant/Inventor.

[ ] Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

SIGNATURE of Applicant or Assignee of Record	
Name	Karl-Heinz Lettmair
Signature	[signature]
Date	

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

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